

## REMARKS

### 1. General

Claims 1 - 19 are pending in the application. The Examiner has objected to the Oath/Declaration. The Examiner has objected to the Drawings. The Examiner has objected to the Specification. The Examiner has objected to Claim 10. The Examiner has rejected Claims 2 – 9 under 35 U.S.C. §112, second paragraph. The Examiner has rejected Claims 1 & 10 - 13 under 35 U.S.C. §103(a) as being unpatentable over **O’Conner** (U.S. Patent No. 4,590,951) in view of **Japuntich et al.** (U.S. Patent No. 6,805,124). The Examiner has rejected Claims 2 - 6 under 35 U.S.C. §103(a) as being unpatentable over **O’Conner** and **Japuntich et al.** and further in view of **Bar-Yona et al.** (U.S. Patent No. 5,022,900). The Examiner has rejected Claims 14 - 19 under 35 U.S.C. §103(a) as being unpatentable over **O’Conner** and **Japuntich et al.** and further in view of **Elstran et al.** (U.S. Patent No. 5,592,935). The Examiner has rejected Claims 7 – 9 under 35 U.S.C. §103(a) as being unpatentable over **O’Conner**, **Japuntich et al.**, and **Bar-Yona et al.**, and further in view of **Elstran et al.**

### 2. Response on Objection to the Oath/Declaration

The Examiner has objected to the Oath/Declaration and has requested a new Oath/Declaration in compliance with 37 C.F.R. §1.67(a). Applicant herewith submits a new Declaration signed by the Applicant/Inventor that addresses the Examiner’s concerns.

### 3. Response on Objection to the Drawings

The Examiner has objected to the Drawings as including reference characters not mentioned in the Specification. Specifically the Examiner has noted reference numbers 202 & 222 in Fig. 2 and reference number 580 in Fig. 6.

Applicant respectfully directs the Examiner's attention to line 9 of paragraph [0061] in the Specification which references "a filter carrier 580" in the discussion of Fig. 6. Applicant therefore believes no amendment is necessary with respect to Fig. 6.

Applicant has amended the Specification at paragraph [0055] to insert the appropriate references to the reference characters not previously mentioned. Specifically, the Applicant has amended the description of Fig. 2 in the Specification to read; "Impeller 206 spins and causes air to be drawn into housing 210, through cartridge 212, into plenum 208 and along wall 222 and up through outlet port 202 and into air tube 4 as indicated by dotted line 220." No new matter has been entered into the disclosure by these amendments as the components mentioned are already disclosed in the Drawing figures, albeit with improper reference characters.

Applicant believes that the above amendments to the Specification obviate the need for any amendments to the Drawing figures.

#### **4. Response on Objection to the Specification**

The Examiner has objected to the cross-reference to related applications in the Specification. Applicant has herewith amended paragraph [0001] to clarify that the parent application upon which priority is based herein not stands abandoned. The parent application was abandoned after the filing of the present Continuation-in-Part Application to maintain co-pendency for the purposes of claiming priority.

#### **5. Response on Objection to the Claims (Claim 10)**

The Examiner has objected to Claim 10 as having a lack of antecedent basis for the "the outside of said blower housing". Applicant has amended the claim to correct this recitation of the claimed element.

**6. Response on Rejection of Claims 2 - 9 under 35 U.S.C. §112, second paragraph**

The Examiner has rejected Claims 2 – 9 under 35 U.S.C. §112, second paragraph as being indefinite. Specifically, the Examiner has requested clarification of the language “two filters secured by wire mesh” in Claim 2.

Applicant has amended Claim 2 to clarify that there are two separate filters, each one having a wire mesh to secure it to the cartridge.

**7. Response on Rejection of Claims 1 & 10 - 13 under 35 U.S.C. §103(a)**

The Examiner has rejected Claims 1 & 10 - 13 under 35 U.S.C. §103(a) as being unpatentable over **O’Conner** (U.S. Patent No. 4,590,951) in view of **Japuntich et al.** (U.S. Patent No. 6,805,124). The Examiner has cited **O’Conner** as disclosing all the elements of the invention claimed in Claim 1 with the exception of a filter being positioned under the exhaust valve in the face mask. The Examiner cites **Japuntich et al.** as disclosing in an air filter face mask, a filter positioned under an exhaust valve. Applicant has amended Claim 1 (and Claim 10) to distinguish the claimed invention from the **O’Conner** reference alone. Applicant points out that, as amended, Claim 1 now defines a structure to the blower housing and filter cartridge configuration that is distinct from and is not anticipated by the **O’Conner** reference.

Specifically, Applicant has amended Claim 1 to clarify the necessary structure for not only the blower housing but also the vacuum plenum defined by the blower housing, as well as the associated filter cartridge that is removably attached to the blower housing. It is these structural distinctions, and the functionality that they provide to the system of the present invention, that improve over the structures and functions disclosed in the **O’Conner** reference.

One objective of the present invention is to provide a powered blower housing that is lightweight and easily worn by the user. The energy required to drive the blower within the

blower housing is dependent upon the size of the fan motor and the fan blades within the blower, as well as the force required to move the volume of air through the blower at a sufficient pressure to maintain the requisite flow to the face mask. **O'Conner** discloses a relatively large canister-type filter with a relatively small opening to the outside air. In order to move sufficient quantities of air through this filter structure, it is necessary to have a relatively large blower motor, and as such, a relatively large power supply to power the motor. Applicant's invention is designed away from these large structures to a structure that is more efficient in moving air with less power. It is noted that in **O'Conner**, the problem associated with moving sufficient quantities of air is recognized and is addressed by adding a second oppositely oriented filter canister to the blower motor enclosure.

Applicant's effort to maintain a sufficient flow of air through the system to the face mask involves optimizing the size of the blower motor (and therefore the power supply required) with the cross-sectional area of the inlet flow port into the vacuum plenum of the blower housing. The amendments to Claim 1 made herein clarify that the vacuum plenum is generally defined by a perimeter wall of the blower housing and a frontal wall of the blower housing. The frontal wall essentially comprises the outward facing surface of the blower housing, over which the filter cartridge is positioned. The amendments to the claim further clarify that the blower itself is positioned between the vacuum plenum and the pressure plenum. The flow openings in Claim 1 are further defined to include at least one outlet port extending from the pressure plenum and at least one inlet port in flow communication with the vacuum plenum. The at least one inlet port defining a flow opening is further clarified to comprise a major portion of the cross-sectional area of the frontal wall of the blower housing.

It is this manner of providing an expansive cross-sectional dimension to the inlet port flow opening that allows the system of the present invention to operate with a relatively small blower and therefore a relatively small power supply. With a large cross-sectional inlet flow, the

force necessary to move air into the blower housing is reduced. Clearly, the small cross-sectional area of the inlet flow in the **O'Conner** structure requires greater force to move a given volume of air into the blower housing. This increase in the cross-sectional area of the inlet flow provides a wider surface area over which the filter cartridge of the system can have affect. This is contrary to the relatively small cross-sectional area of the inlet flow in **O'Conner** which tends to clog the filter medium that is directly associated with the inlet opening and reduce the filter's lifetime before replacement.

One advantage of the **O'Conner** design is the ease with which replacement filter cartridges can be positioned on the blower housing. This is due to the relatively small cross-sectional area associated with the flow through ports on the filter. Ease of filter replacement is therefore a further problem that the present invention attempts to overcome while providing a large surface area for the inlet flow. Applicant solved this problem by providing the structure of the at least one filter cartridge removably attachable to the blower housing as described and claimed in Claim 1. As shown in each of the embodiments of the present invention, the filter cartridge comprises a cross-sectional area that makes up a major portion of the surface area of the frontal wall of the blower housing. The various embodiments under this general scope of constraint provide mechanisms for the easy removal and replacement of the filter cartridge.

The ability of the present invention to function with the structures defined in Claim 1 results in part from general improvements in the quality of air filter media. The device of the present invention, as now claimed, presents a structure that has a larger surface area and is thinner than the cumbersome structure of the **O'Conner** device canister. Applicant's device allows for a filter replacement that can be specified to remove 95%, 99%, or 100% of particles in a non-oily, slightly oily, or very oily environment (filter types 3M; N-95, N-99, N-100, P-95, P-99, P-100, S-95, S-99, and S-100). Improved filter material allows for improved flow through a given cross-sectional area with the same or better filtering characteristics. The amendments

made herein to Claim 1 highlight the benefits associated with such filtering characteristics by providing for a blower housing structure and a filter cartridge structure that permits the inlet flow opening to be much larger in relative size than in previous efforts such as **O'Conner**. In view of the increased efficiency of the filter, the device of the present invention can be made much smaller, even to the point where the device might be worn on a vest pocket or the like. In addition, this smaller configuration results in the ability to reduce the tubing diameter (to the mask component) for easier wear. The reductions in the size and power requirements for the blower motor also result in a system that is less costly to manufacture.

#### 8. Response on Rejection of Claims 2 - 6 under 35 U.S.C. §103(a)

The Examiner has rejected Claims 2 - 6 under 35 U.S.C. §103(a) as being unpatentable over **O'Conner** and **Japuntich et al.** and further in view of **Bar-Yona et al.** (U.S. Patent No. 5,022,900). The Examiner views the **Bar-Yona et al.** reference as disclosing a filter cartridge for use in a forced ventilation apparatus that includes two filters secured by wire mesh. While Applicant believes that the arguments presented above with respect to the amendments in Claim 1 are equally applicable to the combination of references cited here, the reference to **Bar-Yona et al.** may be further distinguished on the nature of the two filter system that it describes. The effort in **Bar-Yona et al.**, as the Examiner acknowledges, is to provide a means for removing both particulates and gaseous contaminants from the air. The two filters, or two-stage filters, as described in **Bar-Yona et al.**, therefore provide a solution to this problem.

The present invention on the other hand is not attempting to define (in Claim 2) a two-stage filter in the nature disclosed and taught by **Bar-Yona et al.** Rather the present invention is describing the use of two separate filters (in Claim 2) that are intended to increase the cross-sectional area associated with the inlet flow into the vacuum plenum of the blower housing. This is contrary to the structure shown in **Bar-Yona et al.** which position the filter in series rather

than in parallel as described and claimed in the present invention. Applicant has amended Claim 2 to clarify the structure and positioning of the two separate filters, each of which is secured by wire mesh to the filter cartridge in parallel orientation.

**9. Response on Rejection of Claims 14 - 19 under 35 U.S.C. §103(a)**

The Examiner has rejected Claims 14 - 19 under 35 U.S.C. §103(a) as being unpatentable over **O'Conner** and **Japuntich et al.** and further in view of **Elstran et al.** (U.S. Patent No. 5,592,935). Applicant has cancelled Claims 14 - 19.

**10. Response on Rejection of Claims 7 - 9 under 35 U.S.C. §103(a)**

The Examiner has rejected Claims 7 - 9 under 35 U.S.C. §103(a) as being unpatentable over **O'Conner**, **Japuntich et al.**, and **Bar-Yona et al.** and further in view of **Elstran et al.** (U.S. Patent No. 5,592,935). The Examiner views the **Elstran et al.** reference as providing primary tubing connected to a blower housing and two lengths of secondary tubing connecting the primary tubing by a y-connector to the face mask by a gasket. Applicant restates the arguments presented above with respect to amended Claim 1 as applicable to the rejection of Claims 7 - 9. Insofar as Claims 7 - 9 depend directly or indirectly from the allowance of Claim 1 (and Claim 2), these arguments should provide for the allowance of Claims 7 through 9 on the same basis.

**SUMMARY/CONCLUSION**

Applicant now respectfully requests reconsideration of the claims previously rejected and their passage to allowance. Should any further impediments to allowance remain, Applicant requests that the Examiner contact the undersigned attorney at the indicated phone number.

Respectfully submitted,

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